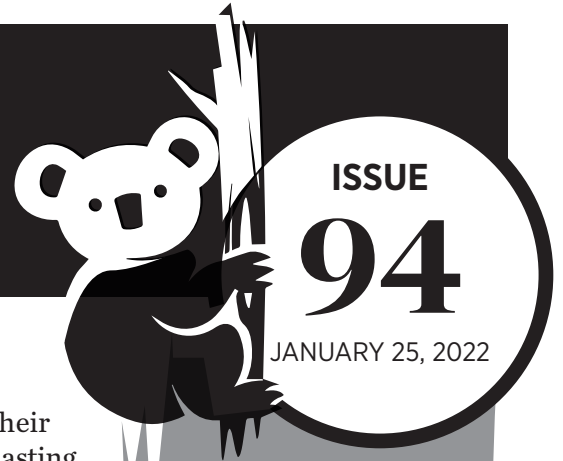


THE WARBLER

AN EDUCATIONAL WEEKLY



Dear Artists, Creators, Friends,

Australia has long been a fascination of mine for many reasons. Firstly, their ancient tribes, known as the aboriginal peoples, have maintained a long-lasting cultural legacy in the region. Their mythologies are different in many ways from Greek mythology for instance, but they share many similarities. Something that I find interesting about this comparison is in their observation of constellations. Constellations are simply a figment of the human imagination in the sense that images are created out of seemingly random placements of massive balls of energy in the galaxy. The Aboriginal traditions saw Baiaame, the creation ancestor, in a constellation that is almost identical to the Orion constellation identified by the Greeks.

Australia has similar population organization to the United States because its population is denser at the coasts, but it is more drastic there. Some may describe traveling to inland Australia as travelling to a different country than coastal Australia. It has pink lakes and is even home to the largest single organism in the world, the Great Barrier Reef. The Great Barrier Reef is one of the best examples of life's interdependency, or the way in which life forms depend on other life forms for basic survival. Not only that, but it hosts some of the most amazing architectural creations in human history. The Sydney Opera House is one example of this, and it holds the premier opera performances in the world. Australian culture has been influenced by English culture as well because of European colonialization.

Beyond all of this, Australia holds life forms that we wouldn't be able to even think of if they didn't already exist. Take the Komodo dragon. It's an apex predator (the dominant predator in its environment) in the form of a 200 pound lizard that can run up to twelve miles per hour. There is also the iconic kangaroo that attracts the attention of biologists. All of this sure makes for one interesting issue of *The Warbler*, and I hope you enjoy reading a little bit about the continent on the opposite side of the world from us.

Taylor and the APAEP Team

“Australia is a nation of compassion. Courage and compassion. And the third of these great values: resilience.” KEVIN RUDD // Former Prime Minister of Australia

WORDS INSIDE

FOUND INSIDE “AUSTRALIA'S ANCIENT ASSASSIN SPIDER ...”

elongated | long in relation to width, especially unusually so

apathy | lack of interest, enthusiasm, or concern

dense | closely compacted in substance

FOUND INSIDE “DNA STUDY FINDS ...”

diverge | separate from another route, especially a main one, and go in a different direction

inhospitable | harsh and difficult to live in

hominin | the group consisting of modern humans, extinct human species and all our immediate ancestors

FOUND INSIDE POEM “WE ARE GOING”

bora | initiation ceremony of the Aboriginal people of Eastern Australia

corroboree | an Australian Aboriginal dance ceremony which may take the form of a sacred ritual or an informal gathering



GEOLOGY

This Australian Meteor Crater is Oldest Known, Says Study

BY AARON J. CAVOSIE | *EarthSky Voices* | January 28, 2020

The world's oldest remaining asteroid crater is at a place called Yarrabubba, southeast of the town of Meekatharra in Western Australia.

Our new study puts a precise age on the cataclysmic impact, showing Yarrabubba is the oldest known crater and dating it at the right time to trigger the end of an ancient glacial period and the warming of the entire planet.

What we found at Yarrabubba

Yarrabubba holds the eroded remnants of a crater 40 miles (70 km) wide that was first described in 2003, based on minerals at the site that showed unique signs of impact. But its true age was not known.

We studied tiny impact-shocked crystals found at the site, which show the crater formed 2.229 billion years ago (give or take 5 million years).

This new, precise date establishes Yarrabubba as the oldest recognized impact structure on Earth. It is some 200 million years older than the next oldest, the Vredefort impact in South Africa.

More intriguing, the geological record shows the Earth had glacial ice before the time of the impact, but afterwards, ice disappeared for hundreds of millions of years. Was the Yarrabubba impact a trigger for global climate change?

How to date an asteroid hit

An asteroid strike is one of the most violent geologic events. In an instant, Earth's crust is squeezed to unimaginable pressures, before exploding and ejecting carnage across the landscape. Large impacts leave behind scars the size of a small city.

The basin formed by an impact will partly fill with molten and pulverized rock from the Earth and from the asteroid itself. The edge of the crater forms a ring of mountains; over time erosion gradually erases the story.

Today, Yarrabubba has been worn down into a minor feature on a barren landscape.

To place the Yarrabubba event in a geologic context, we had to find its age. To find the age, we had to look carefully at minerals in the rocks shocked by the impact such as uranium which decays into lead.

We analyzed the amounts of lead and uranium isotopes in these crystals using mass spectrometry, and found their clocks had been reset 2.229 billion

years ago (give or take 5 million years). That's when we realized Yarrabubba coincided with a major change in Earth's climate.

A different Earth

The Yarrabubba impact occurred during a period in Earth's history called the Proterozoic eon. Long before plants, fish, or dinosaurs, life at this time consisted of simple, multicellular organisms.

As oxygen levels built up, rocks started weathering more, and the atmosphere cooled down. And then ice came, plunging Earth into globally frigid conditions.

Earth has repeatedly dipped into glacial conditions over the last 4.5 billion years. We know about these periods because of deposits of solidified rock and mud that were ground up by glaciers as they bulldozed across Earth's surface..

There is geological evidence that Earth was in an icy phase during the Yarrabubba impact. Rocks in South Africa show that glaciers were present at this time. But it's not clear if the amount of ice was similar to today, or if it covered the world.

Fire and ice

So we found Earth's oldest preserved impact crater, and worked out when the asteroid hit. We also know Earth had ice at the time, but not how much.

To understand the effect of the impact on an ice-covered world, we used computer models based on the physics of shockwaves to estimate how much ice would end up in the atmosphere as water vapor. As it turns out, it's quite a lot.

Our models show that if the Yarrabubba asteroid hit an ice sheet 3 miles (5 km) thick (not an unreasonable estimate), more than 200 billion tons of water vapor would be ejected into the atmosphere. That's about 2% of the total amount of water vapor in today's atmosphere, but would have been a much bigger fraction back then.

Water vapor is a serious greenhouse gas. It's responsible for about half of the heat absorption from solar radiation today.

Global climate models don't yet exist for the Proterozoic Earth, so we don't yet know for sure if the Yarrabubba impact pushed the planet past a tipping point that led to more warming and the end of a possible Snowball Earth. ●



"I think Australia has to be a country which has the 'welcome' sign out."

PAUL KEATING
// Former Prime Minister of Australia

● Edited for space and clarity

CONSERVATION

Australia's ancient assassin spiders were feared extinct after fires. Then, scientists found two alive

BY JENNIFER HASSAN | *Washington Post* | November 17, 2021

With its giant jaw and piercing fangs, the Kangaroo Island assassin spider is back from reported extinction — and while experts are celebrating the rare sighting, other spiders should probably be careful, because they are exactly what this ancient predator likes to eat.

When massive bush fires swept through Australia in 2019 and 2020, claiming hundreds of lives and wiping out more than 27 million acres of land, experts predicted that more than 1 billion mammals, birds and reptiles across the country may also have been injured or killed.

Among the creatures believed to have been eradicated was the assassin spider species found on Australia's Kangaroo Island — which was decimated in bush fires that caused widespread destruction.

But experts desperately searching for signs of life amid the destroyed landscape recently revealed that two of the spider-eating assassins were spotted on the island in September, just 2.4 miles from their last recorded habitat, offering fresh evidence that the distinctive hunters may not have been completely wiped out, as once feared.

Also called the pelican spider because of its elongated neck and powerful jaws, assassin spiders date back to Jurassic times and play a crucial part in helping regulate the ecosystem by controlling pests and pumping nutrients back into the soil while breaking down leaf litter.

Researchers said that two arachnids, a female and a juvenile, were found in leaf litter, but did not specify the exact location of their discovery. Following the sighting they were DNA tested which confirmed they were indeed Kangaroo Island assassin spiders.

"They're vitally important to ecosystem function but they are also largely ignored," Jessica Marsh, an arachnologist and honorary research assistant at South Australian Museum, said of the spiders.

"We have been surveying for the spiders since the fires, so it was an amazing feeling to finally find one," she told the *Guardian*, adding that the search to find and protect other populations would continue.

Described by National Geographic as "little wolves" of the forest that are "brutally effective," the arachnids are known for locking other spiders in their jaws and dangling them in the air until they are dead.

Marsh, who admitted she had an emotional connection to the creatures because of her years of research,

noted that many people do not seem as invested, noting that there is "general political and public apathy towards invertebrates," the *Guardian* added.

While the discovery of the two spiders is somewhat promising, Marsh said that the species' recovery process would be challenging, due to the fact the



A Pelican spider, also known as an Assassin spider.

Photo courtesy of Hannah Wood/Smithsonian

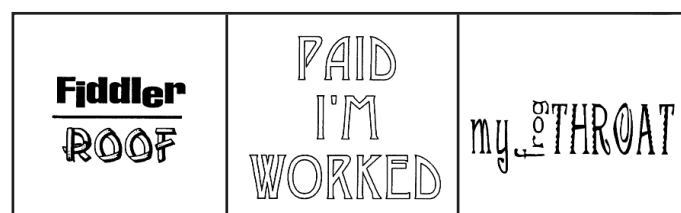
spiders nestle in dense vegetation that will take a long time to grow back following such devastating blazes.

Other assassin spider species can also be found in Madagascar and South Africa.

Taking to social media Wednesday, Marsh told followers that finding this "bizarre, but wonderful little critter" was "one of those career highlights," adding that leaf litter was a fascinating world to explore.

Others, however, were not as excited by the find, with one person tweeting: "'Assassin' and 'spider' are not words I ever want to see next to each other ever again." ●

WORD PLAY A Rebus puzzle is a picture representation of a common word or phrase. How the letters/images appear within each box will give you clues to the answer! For example, if you saw the letters "LOOK ULEAP," you could guess that the phrase is "Look before you leap." *Answers are on the last page!*



MATHEMATICS

Sudoku

#187 PUZZLE NO. 267075

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 6 | | 9 | 8 | | | | 5 |
| | 3 | 4 | | 2 | | | 1 | |
| | | | | 5 | | 4 | | |
| 4 | | | 3 | | | | | 2 |
| | | 9 | | | | | 7 | |
| 7 | | | | | | | | |
| | | | | | 9 | 1 | | |
| | | 1 | | 4 | | | | 8 |
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#188 PUZZLE NO. 9768120

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| | | | | | | | 2 | |
| | | | 2 | 5 | | | 9 | 1 |
| | 3 | | 9 | 1 | | 5 | | 6 |
| | | | | 6 | 7 | 9 | | |
| | | | 3 | | | 1 | 7 | |
| | | 8 | | | | | 5 | |
| | 7 | 1 | | | | 8 | | |
| 8 | | 4 | | 9 | | | | |
| 5 | | | | 7 | | | | |

©Sudoku.cool

SUDOKU HOW-TO GUIDE

1. Each block, row, and column must contain the numbers 1–9.
2. Sudoku is a game of logic and reasoning, so you should not need to guess.
3. Don't repeat numbers within each block, row, or column.
4. Use the process of elimination to figure out the correct placement of numbers in each box.
5. The answers appear on the last page of this newsletter.

| BOX | BLOCK | | | | | | | | |
|-----|-------|---|---|---|---|---|---|---|--------|
| | | | 3 | 9 | | | 1 | | |
| 5 | | 1 | | | | | 4 | | |
| 9 | | | 7 | | | 5 | | | |
| 6 | 2 | 5 | 3 | | | | 7 | | |
| | | | 7 | | | | | 8 | COLUMN |
| 7 | | | 8 | | | 9 | | 3 | |
| 8 | | 3 | | 1 | | | 9 | | |
| | 9 | | 2 | | 6 | | | 7 | |
| 4 | | | | | 3 | | 6 | 1 | |
| | | | | | | | | | ROW |

What the example will look like solved 📌

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | 4 | 8 | 3 | 9 | 5 | 7 | 1 | 6 |
| 5 | 7 | 1 | 6 | 2 | 8 | 3 | 4 | 9 |
| 9 | 3 | 6 | 7 | 4 | 1 | 5 | 8 | 2 |
| 6 | 8 | 2 | 5 | 3 | 9 | 1 | 7 | 4 |
| 3 | 5 | 9 | 1 | 7 | 4 | 6 | 2 | 8 |
| 7 | 1 | 4 | 8 | 6 | 2 | 9 | 5 | 3 |
| 8 | 6 | 3 | 4 | 1 | 7 | 2 | 9 | 5 |
| 1 | 9 | 5 | 2 | 8 | 6 | 4 | 3 | 7 |
| 4 | 2 | 7 | 9 | 5 | 3 | 8 | 6 | 1 |



“There’s an ease that I have living in Australia. The best things about Sydney are free: the sunshine’s free, and the harbour’s free, and the beach is free.”

RUSSEL CROWE // actor from New Zealand



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Language

Australian Slang

Ankle biter — child
Brolly — umbrella
Bugged — exhausted
Cactus — dead, broken
Chook — chicken
Crikey — expression of surprise
Larrikin — someone who's always up for a laugh, bit of a harmless prankster
Mozzie — mosquito
Pash — to kiss
Sanger — sandwich
Snag — sausage
Woop woop — middle of nowhere

Source: <https://nomadsworld.com/aussie-slang/>

DID YOU KNOW?

Queen Elizabeth II once **fired the entire Australian Government** after a government shutdown provoked by a deadlock over budgetary squabbling.

Melbourne holds more **Greek residents** than any other city in the world.

Australia has 24.6 million people, but **100 million sheep** living on it.

Australia **exports sand** to the Middle East because it is high enough quality for sandblasting and pressure-cleaning.

The area of Australia that is **covered by snow** in the winter is larger than the area of Switzerland.

Australia is the only continent **without an active volcano**.

Source: www.telegraph.co.uk/travel/destinations/oceania/australia/articles/curious-facts-prove-strange-diverse-place-on-earth/



THE ECHIDNA AND THE PLATYPUS, THE ONLY TWO MAMMALS ON EARTH THAT LAY EGGS, ARE NATIVE TO AUSTRALIA.



IN 2010, A TELEVISED AUSTRALIAN ELECTION DEBATE HAD TO BE RESCHEDULED SO AS NOT TO CLASH WITH THE TV FINALE OF MASTERCHEF.

“Thank you to Australia for letting me know that I’m OK just the way I am.”

TONES AND I // Australia singer-songwriter

ART + CULTURE

We are Going

BY OODGEROO NOONUCCAL

They came in to the little town
 A semi-naked band subdued and silent
 All that remained of their tribe.
 They came here to the place of their old bora ground
 Where now the many white men hurry about like ants.
 Notice of the estate agent reads: 'Rubbish May Be Tipped Here'.
 Now it half covers the traces of the old bora ring.
 'We are as strangers here now, but the white tribe are the strangers.
 We belong here, we are of the old ways.
 We are the corroboree and the bora ground,
 We are the old ceremonies, the laws of the elders.
 We are the wonder tales of Dream Time, the tribal legends told.
 We are the past, the hunts and the laughing games, the wandering camp fires.
 We are the lightening bolt over Gaphembah Hill
 Quick and terrible,
 And the Thunderer after him, that loud fellow.
 We are the quiet daybreak paling the dark lagoon.
 We are the shadow-ghosts creeping back as the camp fires burn low.
 We are nature and the past, all the old ways
 Gone now and scattered.
 The scrubs are gone, the hunting and the laughter.
 The eagle is gone, the emu and the kangaroo are gone from this place.
 The bora ring is gone.
 The corroboree is gone.
 And we are going.'

Oodgeroo Noonuccal was an Australian Aboriginal woman who emerged as a prominent political activist and writer during the 1960s. Her 1964 poetry collection *We Are Going* was the first book to be published by an Australian Aboriginal woman. She was also recognized for her activism, particularly her role in lobbying for the reform of the Australian constitution granting Aboriginal people full citizenship. Oodgeroo was awarded several literary awards during her lifetime, including the Mary Gilmore Medal in 1970, the Jessie Litchfield Award in 1975, and the Fellowship of Australian Writers' Award.

WRITING PROMPT

From Tasmanian Tigers to the Goliath 'Bird Eating Spider,' some of the most unique (and a bit terrifying) wildlife is found in Australia. This week, write a poem, short story, or creative non-fiction essay inspired by an odd natural phenomena either found in real-life or made up yourself.

Word Search

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | E | T | E | N | L | K | T | E | L | G | A | E |
| I | A | I | N | B | D | N | L | L | D | D | O | E | G |
| O | S | A | A | N | O | R | N | M | E | E | S | E | A |
| R | B | R | E | A | E | R | T | A | M | L | I | G | L |
| G | B | G | O | L | O | T | A | L | B | I | I | U | I |
| T | E | E | L | U | E | A | I | E | T | G | N | M | F |
| L | T | A | N | O | A | L | E | E | D | N | U | I | I |
| G | A | O | E | R | E | E | T | M | A | N | M | O | R |
| E | O | L | A | B | N | I | E | L | N | E | E | E | E |
| M | B | L | I | N | S | A | E | E | T | L | E | G | I |
| E | I | R | E | B | A | E | R | S | I | L | E | N | T |
| I | T | F | G | E | E | G | M | R | G | E | K | G | A |
| E | R | R | I | D | I | A | O | F | I | E | G | E | M |
| F | D | R | A | O | L | K | A | N | G | A | R | O | O |

BORA
 FIRE
 ANT
 LEGEND
 EMU
 TALE
 TRIBE
 SILENT
 EAGLE
 KANGAROO

ANTHROPOLOGY

DNA Study Finds Aboriginal Australians World's Oldest Civilization

BY CHRISTOPHER KLEIN | *History.com* | August 22, 2018

The newly published paper is the first extensive DNA study of Aboriginal Australians, according to the University of Cambridge. Working in close collaboration with indigenous Australian elders and leaders, an international team of researchers obtained permission to extract DNA from the saliva of 83 Aboriginal Australians and 25 Papuans from New Guinea and sequence their complete genetic information.

While some scholars have theorized that indig-

enous Australians descended from a separate, earlier migration than that of Eurasian people, the study's authors report that the majority of non-Africans stem from a single ancestral group of migrants who left Africa approximately 72,000 years ago and eventually spread across the other continents. While European and Asian ancestral groups became distinct in the genetic record around 42,000 years ago, the researchers say that occurred even earlier—approximately 58,000 years ago—in the case of indigenous Papuan and Australian ancestral groups as they ventured eastward.

“Our results suggest that, rather than having left in a separate wave, most of the genomes of Papuans and Aboriginal Australians can be traced back to a single ‘Out of Africa’ event which led to modern world-wide populations,” said Manjinder Sandhu, a senior author from the Sanger Institute and University of Cambridge, in a statement released by the university. “There may have been other migrations, but the evidence so far points to one exit event.”

Around 50,000 years ago, the wave of migration reached Sahul, a prehistoric supercontinent composed of present-day Australia, Tasmania and New Guinea prior to their separation by rising sea levels 10,000 years ago. At that time, according to the study's authors, Aboriginal Australians became genetically isolated, making it the world's oldest civilization.

The study also found that Aboriginal Australians and Papuans diverged from each other about 37,000 years ago, although the reason is unclear because the water separation between New Guinea and Australia had yet to be completed. The researchers theorize the break could have been attributed to early flooding of the Carpentaria Basin that left Australia connected to New Guinea by only a narrow, impassable strip of land. By 31,000 years ago, Aboriginal Australian communities became genetically isolated and started to diverge

greatly from one another, likely due to the development of the inhospitable desert in the interior of the continent.

“The genetic diversity among Aboriginal Australians is amazing,” said Anna-Sapfo Malaspinas, one of the lead authors and an assistant professor at the Universities of Copenhagen and Bern. “Because the continent has been populated for such a long time, we find that groups from southwestern Australia are genetically more different from northeastern Australia, than, for example, Native Americans are from Siberians.”

Scholars have long been flummoxed as to why the language spoken by 90 percent of Australia's Aboriginal people is relatively young—approximately 4,000 years old according to language experts—if their ancestors had occupied the continent so much earlier. One possible answer has been that a second migration into Australia by people speaking this language occurred around 4,000 years ago. The authors of the new study, however, say a previously unidentified internal dispersal of Aboriginal people that swept from the northeast across Australia around that time led to the linguistic and cultural linking of the continent's indigenous people. Although they had a sweeping impact on ancient Australian culture, these “ghost-like” migrants mysteriously disappeared from the genetic record.

“It's a really weird scenario,” said evolutionary geneticist Eske Willerslev, a lead author of the study and a professor at the Center for GeoGenetics at the University of Copenhagen. “A few immigrants appear in different villages and communities around Australia. They change the way people speak and think; then they disappear, like ghosts. And people just carry on living in isolation the same way they always have. This may have happened for religious or cultural reasons that we can only speculate about. But in genetic terms, we have never seen anything like it before.”

One other notable finding from the DNA study is evidence of an “uncharacterized” hominin group that interbred with modern humans as they migrated through southeast Asia on their way to Australia. According to the study, around four percent of the Aboriginal Australian genome comes from this unknown human relative. “We don't know who these people were, but they were a distant relative of Denisovans (an extinct human species from Siberia), and the Papuan/Australian ancestors probably encountered them close to Sahul,” Willerslev said. ●



“It's not the way you look, it's not about the colour of your skin, it's about being accepted and understood as Aboriginal within the community.”

LINDA BURNEY //
First Indigenous person elected to the New South Wales Parliament

ENVIRONMENT

One year since Australia's devastating wildfires, anger grows at climate change 'inaction'

"I feel ashamed of our country as it's allowed some sort of short-term cynical politics to prevent proper climate action," one survivor said.

BY NICK BAKER | NBC News | February 4, 2021

Not long after Jack Egan's home burned down during Australia's "Black Summer" wildfires a year ago, he made a life-changing decision.

At 60, Egan quit his job so he could spend his days campaigning for stronger action on climate change, a national and global challenge he said was "akin to a war."

"I was working quite happily in aged care ... but the fires caused me to devote the rest of my life to volunteer on climate action. I took an early retirement and that's what I do full time now," he said.

Egan, whose property in Rosedale on the country's south-east coast has still not been rebuilt, recalled how "the fires had a behavior that was new to Australia, or new to me at least ... and the length of the fires — months — was really shocking."

February marks one year since Australia's catastrophic wildfire season started to ease, after leaving 34 people dead and torching at least 18 million hectares of land (nearly 44.5 million acres). It was, in the words of one state premier, "the most devastating natural disaster in living memory."

For Egan, it has been a year not only of recovery, but also of action. He spreads the word on "climate solutions and the benefits therein" around small, regional communities and was part of a delegation of survivors that took the remnants of their charred homes to Australia's Parliament House, urging politicians to do more.

"It [the Australian government] is doing as little as possible, as little as they can get away with," Egan said. "I feel ashamed of our country as it's allowed some sort of short-term cynical politics to prevent proper climate action."

Despite a chorus of scientists saying climate change is contributing to longer and more intense wildfire seasons, Prime Minister Scott Morrison refused to introduce any major climate measures after the disaster. Mass protests were held across the country calling for tougher climate action, but Morrison remained unmoved.

Morrison leads a conservative coalition government, which has been in power since 2013. His government's track record on climate includes repealing the

country's carbon tax and Morrison famously bringing a lump of coal into Parliament, saying, "Don't be scared, it won't hurt you."

The prime minister's office did not respond to requests for comment.

Morrison has acknowledged the threat of climate change and routinely defends a "sensible" response. As part of the Paris climate agreement, his government committed to cutting greenhouse gas emissions by at least 26 percent by 2030 compared to 2005 levels.

But climate advocacy groups say much stronger commitments are needed, especially as Australia has



one of the world's highest per capita levels of emissions and is among the biggest fossil fuel exporters.

"We know very clearly the Black Summer fires were fueled by climate change and that Australia has to play a much bigger part in addressing its contribution to that problem," Simon Bradshaw of the Climate Council, an advocacy group, said. "But we haven't seen the federal government do anything further to actually tackle the root cause of the climate crisis."

"We've seen the government refuse to strengthen its 2030 emissions reduction targets," Bradshaw added, "... and also refuse to commit to achieving net

A kangaroo rushes past a burning house in Lake Conjola, Australia, on Dec. 31, 2019.

Photo by Matthew Abbott / The New York Times via Redux Pictures

zero emissions by 2050 or earlier. At this point, we're pretty much alone among developed countries having refused to do either of those things."

More than 100 countries have set net zero targets. This week, Morrison went as far as saying that net zero emissions by 2050 would be "preferable." But when pressed for specifics, he said, "When I can tell you how we get there, that's when I'll tell you when we're going to get there."

In the meantime, the research group Climate Action Tracker rates the government's response as "insufficient."

A patchwork recovery

As a political battle around climate change is being fought in Australia, the country is also counting the cost of the wildfires on its flora and fauna.

Basha Stasak, the nature program manager at the Australian Conservation Foundation, said the disaster "really hit all swaths of the animal world."

"It's estimated that 3 billion animals were killed or displaced by the bushfires last summer," Stasak said. "This includes really iconic species that are known around the world, like the koala, which lost an estimated 30 percent of its habitat in New South Wales."

A report by WWF-Australia found that more than 60,000 koalas were affected by the infernos, which it called "a deeply disturbing number for a species already in trouble."

There is slightly better news when it comes to Australia's flora.

Patrick Norman, an ecologist at Griffith University and a researcher with the Bushfire Recovery Project, said most Australian forests have adaptations in order to survive fire.

"[Many forests] are recovering how they should and are responding particularly well after a La Niña year, which has been excellent. Most of the areas impacted had a good, high amount of rainfall in 2020."

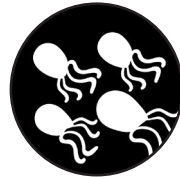
But he said some subalpine areas in New South Wales and Victoria, along with wetter forests in northern New South Wales were not recovering as well due to the especially brutal fire conditions.

"They [the fires] were just an enormous event," Norman said. "It's definitely scary looking into the future, at a further warming climate. We're only just starting to see the impacts now." ●

RANDOM-NEST

Natural Phenomena

BY OT STAFF | OUTLOOK TRAVELER



Bioluminescent Plankton | JERVIS BAY

Known for its pristine white sandy beaches and oceans views fit for a postcard, Jervis Bay is even more wondrous at night when its shores come aglow. Due to a natural chemical reaction within plankton, they become luminescent and emanate a blue glow. Visible only in the dead of night, this is especially common in Australia's spring and summer seasons when the water is warmer.



Pink Lakes | SOUTH AND WESTERN AUSTRALIA

Australia is home to many mesmerising natural attractions but its extraordinary pink lakes have to be seen to be believed. There are a plethora of beautiful hues to pick from. While Lake Hillier has a bubblegum pink hue that contrasts with the dark blue waters of the Indian Ocean, the Hutt Lagoon changes from red to pink and even lilac purple. And perhaps the most picturesque lake of them all, Lake MacDonnell, separates its pink waters from the neighbouring blue-green waters of Cactus Beach.



Coral Spawning | GREAT BARRIER REEF, QUEENSLAND

In simple terms, coral spawning is the reef reproducing. Coral polyps simultaneously release egg and sperm bundles that they've spent months growing into the ocean for external fertilisation. This happens in a mass event annually often affectionately named the world's largest orgasm by locals. This rare phenomenon lasts only a few nights.



The World's Largest Dinosaur Footprints | BROOME, WESTERN AUSTRALIA

Australia's very own Jurassic Park is anything but fiction. The world's largest dinosaur footprints can be found on the north coast of Broome in Western Australia. At 1.7-metres long, these fossilised dinosaur footprints are 130 million years old and extend in patches for 80km along the coast. At the southern end of Cable Beach is Gantheaume Point, there is a scenic area of red sandstone cliffs footprints of dinosaurs located on the flat rocks 30 metres out to sea and are only visible at low tide.

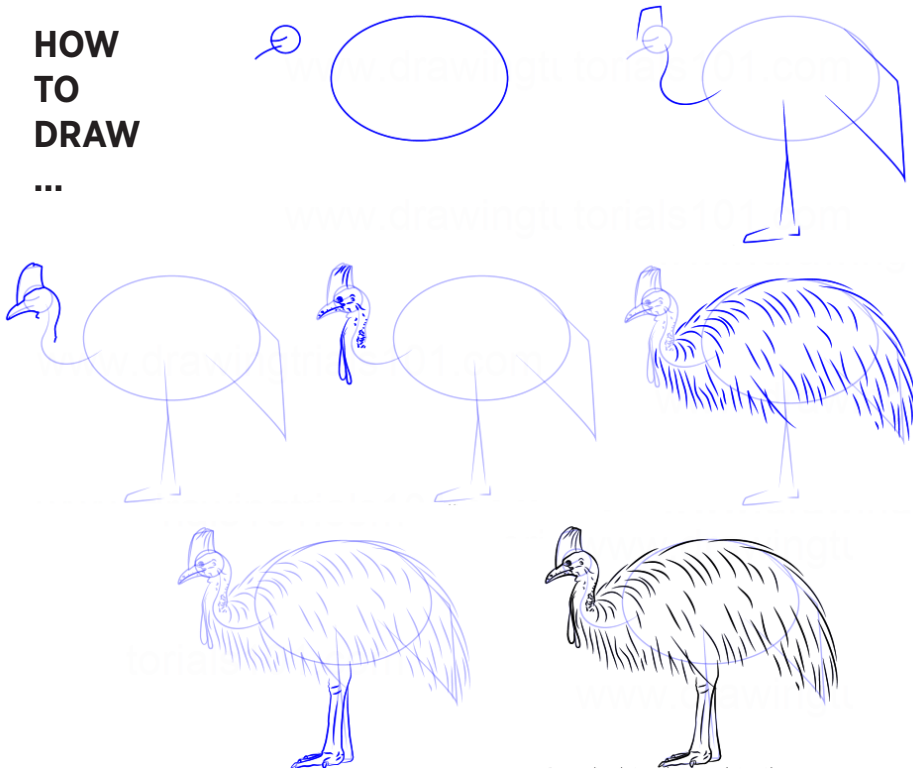


Morning Glory Clouds | BURKETOWN, QUEENSLAND

A rare meteorological phenomenon, the aptly named 'Morning Glory Clouds' roll across the Gulf and can be observed above the skies in Burketown. The cloud formation holds particular cultural significance to the Ganggalidda Garawa people, one of the world's oldest cultures and an integral part of the fabric of Australia's cultural heritage. They believe that the clouds were a creation of Walalu, the Rainbow Serpent.

HOW TO DRAW

...



A SOUTHERN CASSOWARY | large, flightless blackbird found in Australia



WORDS OF ENCOURAGEMENT

From August 2019 to March 2020, Australians experienced one of the worst natural disasters: bushfires. While the fires are not unusual for their hot, dry climate, record-breaking high temperatures and intense bouts of drought led to much of the continent aiding to fight the blaze. However, even during this time of intense destruction, people became more united in trying to aid each other and the surrounding wildlife. Firefighters from America, particularly from California where intense fires also ravage, flew to Australia to offer their services. Threatened by extinction, many Australians took to aiding the animals of their land, like the teenagers who filled their car with koalas to keep them safe from the flames. Nearly \$450 million was donated around the world to aid in resources and relief efforts for the bushfires. Though an extremely devastating and traumatic event for the continent, this story reminds us of our individual power in helping others during times of crisis. How even in times of complete devastation, we can find people banding together in support and reconstruction. Help or kindness can be given in a variety of different ways or acts, so always remember that you are not alone in your journey; that each of our individual efforts when working in unison can incite great change and development. We wish you all the love and support in your journey here at the *Warbler* and hope you enjoyed this edition!

Julia



1061 Beard-Eaves Memorial Coliseum // Auburn University, AL 36849

"I love all kinds of insects, and I've heard Australia has some really interesting bugs."

AURORA // Norwegian singer-songwriter

Answers

SUDOKU #187

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 7 | 9 | 8 | 4 | 2 | 3 | 5 |
| 5 | 3 | 4 | 7 | 2 | 6 | 8 | 1 | 9 |
| 9 | 2 | 8 | 1 | 5 | 3 | 4 | 6 | 7 |
| 4 | 5 | 6 | 3 | 7 | 1 | 9 | 8 | 2 |
| 2 | 1 | 9 | 4 | 6 | 8 | 5 | 7 | 3 |
| 7 | 8 | 3 | 5 | 9 | 2 | 6 | 4 | 1 |
| 6 | 7 | 2 | 8 | 3 | 9 | 1 | 5 | 4 |
| 3 | 9 | 1 | 6 | 4 | 5 | 7 | 2 | 8 |
| 8 | 4 | 5 | 2 | 1 | 7 | 3 | 9 | 6 |

SUDOKU #188

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|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 9 | 7 | 8 | 6 | 3 | 2 | 4 |
| 4 | 8 | 6 | 2 | 5 | 3 | 7 | 9 | 1 |
| 2 | 3 | 7 | 9 | 1 | 4 | 5 | 8 | 6 |
| 3 | 1 | 5 | 8 | 6 | 7 | 9 | 4 | 2 |
| 6 | 9 | 2 | 3 | 4 | 5 | 1 | 7 | 8 |
| 7 | 4 | 8 | 1 | 2 | 9 | 6 | 5 | 3 |
| 9 | 7 | 1 | 4 | 3 | 2 | 8 | 6 | 5 |
| 8 | 6 | 4 | 5 | 9 | 1 | 2 | 3 | 7 |
| 5 | 2 | 3 | 6 | 7 | 8 | 4 | 1 | 9 |



Rebus Puzzle

Page 3

1. Fiddler on the Roof
2. I'm overworked and underpaid
3. A frog in my throat

Send ideas and comments to:

APAEP
1061 Beard-Eaves
Memorial Coliseum
Auburn University, AL 36849

UNTIL NEXT TIME 🙌!